UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,573	04/21/2004	Matthew A. Ahrens	03226.390001; P8399	5289

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EXAMINER
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ART UNIT	PAPER NUMBER
2135	

NOTIFICATION DATE	DELIVERY MODE
06/02/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>22 February 2008</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1,5,7-11,18 and 20-27</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1,5,7-11,18 and 20-27</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
          application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>02/22/2008 & 03/31/2008</u>.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1, 5, 7-11, 18 and 20-27 are pending in this application.

2.   Claims 1, 5, 18, 20 and 25-26 are presently amended.

3.   Claims 2-4, 6, 12-17 and 19 are cancelled.

4.   Claim 27 is newly presented.

Continued Examination Under 37 CFR 1.114

5.   A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR

1.17(e), was filed in this application after final rejection. Since this application is eligible for continued

examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the

finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's

submission filed on 22 February 2008 has been entered.

Claim Rejections - 35 USC § 103

6.   Claims 1, 5, 7-11, 18 and 20-27 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Talagala et al. (Pub. No.: US 2002/0161972 A1) (hereinafter "Talagala") and further in view of

Sawdon et al. (Patent No.: US 6,829,617 B2) (hereinafter "Sawdon").

7.   As to claim 1, Talagala discloses a method for storing data blocks (abstract), comprising:

storing a first data block and a second data block in a storage pool (Talagala teaches this concept by

providing parity/stripe group tables having entries for multiple blocks of data stored in a storage pool,

-e.g. [0059], FIG. 6C, 7B and 8B); obtaining a first data block location and a second data block

location ([0017], [0059]); calculating a first data block checksum for the first data block (Talagala

discloses writing blocks having checksum and location in PGT (Parity Group Table) which have

"segment" filed to store locations and "checksum" fields to store checksum, -e.g. [0059], FIG. 6C, 7B

and 8B); calculating a second data block checksum for the second data block ([0059], FIG. 6C, 7B

and 8B); storing a first indirect block at a first indirect block location the storage pool, wherein the first

indirect block comprises a first block pointer comprising the first data block location and the first data

block checksum and a second block pointer comprises the second data block location and the

second data block checksum ("an indirection map (e.g., block remapping table) matches virtual block

address to physical block address. Block-level checksums may be provided in the indirection map" –

e.g. [0059] and FIG. 6C; "each valid PGT entry also includes a back pointer to the next entry in a

parity group so that the first physical segment in a parity group is linked to the second physical

segment in that parity group, and the second physical segment to the third and so on, until the last

physical segment contains the parity data for that parity group. The physical segment that contains

the parity data in linked back to the first physical segment in the parity group, thereby creating a

circular list for that parity group" –e.g. [0056], Applicant should note that a circular linked list will

comprise "a first physical segment in a parity group" which comprises a first indirect block referencing

the first and second data blocks and so on as claimed by applicant). calculating a first indirect block

checksum for the first indirect block by applying a checksum function to the first indirect block ([0059],

[0061]); and storing a second indirect block at a second indirect block in the storage pool, wherein the

second indirect block comprises the first indirect block location and the first indirect block checksum

(Talagala teaches writing a block having a checksum and a location in PGT (Parity Group Table)

which have a "segment" field to store a location and a "checksum" field to store a checksum and

provides which contain parity/stripe group tables having entries for multiple blocks of data stored in a storage pool, -e.g. [0059] and FIG. 6C, 7B and 8B).

Talagala is silent on wherein each of the first data block location, the second data block location, the first indirect block location and the second indirect block location are separate physical locations in the storage pool. However, Sawdon discloses wherein each of the first data block location, the second data block location, the first indirect block location and the second indirect block location are separate physical locations in the storage pool (FIG. 2B, 8D, 15A, col. 7, lines 9-30, col. 9, lines 13-26, col. 13, lines 52-65 and col. 20, lines 11-31).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the teaching of Talagala as taught by Sawdon in order to "support time sensitive processing tasks such as external data communications processing (Sawdon, col. 2, lines 30-35)."

8.   As to claim 5, Talagala discloses further comprising: storing a birth value in a birth field in the first block pointer ("a hashed indirection table (HIT) which maintains generational images" and explains that "the PGT index columns are now labeled version zero through version two, where version zero corresponds to the most current version and version two corresponds to the oldest version" –e.g. [0065]).

9.   As to claim 7, Talagala discloses wherein the storage pool comprises at least one storage device ("array of storage devices 410" –e.g. FIG. 2 and 3, [0033]).

10.   As to claim 8, Talagala discloses wherein the storage pool is divided into a plurality of

metaslabs (Talagala teaches having different "stripes of data" within an array storage devices –e.g.

[FIG. 4 and [0043] and explains that a "stripe" of data is analogous to a "parity group" –e.g. [0063],

lines 10-11, wherein configuration information for each of the "parity groups" is stored in a "PGT

(parity group table)" –e.g. FIG. 6C, 7B and 8B, and further explains "the indirection map may also

include a parity group pointer for each data block that points to a next member of that parity group" –

e.g. [0013], wherein "when a READ or WRITE command is received for a block(s), the appropriate

PGT entry is accessed to locate the blocks in the disk drives" –e.g. [0058]. As defined by Applicant,

metaslabs are "contiguous regions of data" in which "the storage space in the storage pool is divided"

(Specification, [0032]); therefore, Applicant should note that these metaslabs may comprise any

amount of contiguous data, such as segments or blocks into which a storage pool is divided, as

described by Talagala).

11.   As to claim 9, Talagala discloses wherein each of the plurality of metaslabs is associated with

a metaslab ID (Talagala teaches this concept as each virtual block has a virtual address which is

used to access a "HIT (Hash Indirection Table)" which contains "PGT (Parity Group Table) indices to

access a PGT which contains configuration information for each of the parity groups/metaslabs such

as a segment field which indicated the physical disk location (disk and segment) of parity groups. –

e.g. FIG. 6B, 6C, 7A, 7B, 8A and 8B, [0055], [0058], [0059]).

12.   As to claim 10, Talagala discloses wherein the first data block location comprises the metaslab

ID (Talagala teaches this concept as "the indirection map may also include a parity group pointer for

each data block that points to a next member of that parity group" –e.g. [0013], wherein "when a

READ or WRITE command is received for a block(s), the appropriate PGT entry is accessed to locate

the blocks in the disk drives" –e.g. [0058], "HIT (Hash Indirection Table)" and explains having "PGT

(Parity Group Table)" indices to access a PGT which contains configuration information for each of

the parity groups such as a segment field which indicated the physical disk location (disk and

segment) of parity groups –e.g. [0055], [0058], [0059] and FIG. 6B, 6C, 7A, 7B, 8A and 8B). Talagala

provides an example in which Virtual address 0 corresponds to PGT index 12, which contains valid

data at physical segment D1.132 wherein "this may be interpreted as Disk 1, segment 132" –e.g.

[0057] and Figures 6B, 6C, 7A, 7B, 8A and 8B). As defined by Applicant, metaslabs are "contiguous

regions of data" in which "the storage space in the storage pool is divided" (Specification, [0032]);

Therefore, Applicant should note that these metaslabs may comprise any amount of contiguous data,

such as segments or blocks into which a storage pool is divided, as described by Talagala) and an

offset (Talagala teaches this concept as entries stored under the "next entry in Parity Group" field in

PGT (Parity Group Table) which points to the next virtual block entry, -e.g. [0057] and FIG. 6B, 6C,

7A, 7B, 8A and 8B).

13.   As to claim 11, Talagala discloses wherein storing the first data block and the second data

block comprises using a storage pool allocator ("Storage Controller 401" –e.g. FIG. 2 and 3, [0033],

[0059]).

14.   As to claim 18, Talagala discloses a system for storing data blocks, comprising: a storage pool

comprising a first data block, a second data block and a first indirect block referencing the first data

block and the second data block, wherein the first indirect block comprises a first data block

checksum and a first data block location stored in a first block pointer, and a second data block

checksum and a second data block location stored in a second block pointer ([0016], [0017], [0058] –

[0059]); a second indirect block, comprising a first indirect data block checksum and a first indirect

block location ([0059] and FIG. 6C, 7B and 8B); and a storage pool allocator configured to store the

first data block, the second data block, and the second indirect block in a storage pool (FIG. 2 and 3,

[0033], "Storage Controller 401").

Talagala is silent on wherein each of the first data block location, the second data block

location, the first indirect block location and the second indirect block location are separate physical

locations in the storage pool. However, Sawdon discloses wherein each of the first data block

location, the second data block location, the first indirect block location and the second indirect block

location are separate physical locations in the storage pool (FIG. 2B, 8D, 15A, col. 7, lines 9-30, col.

9, lines 13-26, col. 13, lines 52-65 and col. 20, lines 11-31).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the

invention was made to modify the teaching of Talagala as taught by Sawdon in order to "support time

sensitive processing tasks such as external data communications processing (Sawdon, col. 2, lines

30-35)."

15.   As to claim 20, Talagala discloses further comprising: a data management unit configured to

assemble the first indirect block and request the storage pool allocator to store the first indirect block

("Storage Controller 401" –e.g. FIG. 2 and 3, [0033]).

16.   As to claim 21, Talagala discloses wherein the storage pool comprises at least one storage

device ("array of storage devices 410" –e.g. FIG. 2 and 3, [0033]).

17.   As to claim 22, it is rejected using the same rationale as for the rejection of claim 8.

18.   As to claim 23, it is rejected using the same rationale as for the rejection of claim 9.

19.   As to claim 24, it is rejected using the same rationale as for the rejection of claim 10.

20.   As to claims 25 and 27, these are rejected using the same rationale as for the rejection of

claim 1.

21.   As to claim 26, Talagala discloses a network system having a plurality of nodes, comprising: a

storage pool comprising a first data block, a second data block and a first indirect block referencing

the first data block and the second data block, wherein the first indirect block comprises a first data

block checksum and a first data block location stored in a first block pointer, and a second data block

checksum and a second data block location stored in a second block pointer ([0016], [0017], [0058] –

[0059]); a second indirect block, comprising a first indirect data block checksum and a first indirect

block location ([0059] and FIG. 6C, 7B and 8B); and a storage pool allocator configured to store the

first data block, the second data block and the first indirect block, and the second indirect block in a

storage pool (FIG. 2 and 3, [0033], "Storage Controller 401"), wherein the storage pool is located on

any one of the plurality of nodes ([0017], [0059], [0051]), and wherein the storage pool allocator is located on any one of the plurality of nodes ([0017], [0033], [0059], [0051]) and FIG. 6C).

Talagala is silent on wherein each of the first data block location, the second data block location, the first indirect block location and the second indirect block location are separate physical locations in the storage pool. However, Sawdon discloses wherein each of the first data block location, the second data block location, the first indirect block location and the second indirect block location are separate physical locations in the storage pool (FIG. 2B, 8D, 15A, col. 7, lines 9-30, col. 9, lines 13-26, col. 13, lines 52-65 and col. 20, lines 11-31).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the teaching of Talagala as taught by Sawdon in order to "support time sensitive processing tasks such as external data communications processing (Sawdon, col. 2, lines 30-35)."

22.   Examiner's note: Examiner has cited particular columns and line numbers in the references as applied to the claims above for the convenience of the Applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may be applied as well. It is respectfully requested from the applicant, in preparing the responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

Response to Amendment

23.   Applicant has amended claims 1, 5, 18, 20 and 25-26 and newly presented claim 27, which

necessitated new ground of rejection. Please see rejection above.

Conclusion

24.   Any inquiry concerning this communication or earlier communications from the examiner

should be directed to SUMAN DEBNATH whose telephone number is (571)270-1256. The examiner

can normally be reached on 8 am to 5 pm.

      If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor,

Kim Y. Vu can be reached on 571 272-3859. The fax phone number for the organization where this

application or proceeding is assigned is 571-273-8300.

      Information regarding the status of an application may be obtained from the Patent Application

Information Retrieval (PAIR) system. Status information for published applications may be obtained

from either Private PAIR or Public PAIR. Status information for unpublished applications is available

through Private PAIR only. For more information about the PAIR system, see http://pair-

direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the

Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-

786-9199 (IN USA OR CANADA) or 571-272-1000.

/S. D./
Examiner, Art Unit 2135
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